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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,331	02/18/2004	Yasuji Takenaka	245402008400	5400

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EXAMINER	
MOVVA, AMAR	
ART UNIT	PAPER NUMBER
2891	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

BL

Office Action Summary	Application No.	Applicant(s)	
	10/782,331	TAKENAKA, YASUJI	
	Examiner	Art Unit	
	Amar Movva	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 7-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9-14-07 7-18-07 6-28-07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

PLEASE NOTE: A new examiner, Amar Movva, has been assigned to this case. Applicant is advised to note the revised contact information in the Conclusion section of this office action.

Allowable Subject Matter

The indicated allowability of claim 20-22 is withdrawn in view of the newly discovered reference(s) to Motokazu '044. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2,7-10, and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 in view of Kunhiro '759 (as cited by applicant).

a. Regarding claims 1-2, 8-10, 12-13, and 17-19:

i. Abe discloses a semiconductor light-emitting device, comprising: a lead frame (32, fig. 9) having a main surface in which a first region and a second region extending along a periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a first resin member (35, fig. 4) having a first reflectivity with

respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said semiconductor light-emitting element; and a second resin member (31, fig. 4) having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element; wherein said first resin member includes a first top surface (fig. 9), said second resin member includes a second top surface that is provided at a position where a distance from said main surface is greater than a distance from said main surface to said first top surface (fig. 9), and an inner wall that is provided on a side where said semiconductor light-emitting element is located and extends in a direction away from said main surface to reach said second top surface (fig. 9), said inner wall provides a reflecting surface for reflecting light emitted from said first top surface at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface (fig. 9). A metallic wire (36, fig. 9) having one end connected to said semiconductor light-emitting element and another end connected to said main surface, and said first resin member is provided to completely cover said metallic wire. The lead frame is formed in a plate shape extending in one plane (fig. 9). The lead frame includes a first depression that is formed at an opposite surface with respect to said main surface and filled with a resin (34, fig. 9),

and terminal portions to be electrically connected to a mounting board are provided on said opposite surface, on respective sides of said first depression (fig. 9). The lead frame includes a second depression formed at said first region, and said semiconductor light-emitting element is provided in said second depression (fig. 9). The second resin member is formed such that an area of a shape defined by said inner wall in a plane parallel to said main surface increases with an increase of a distance from said main surface (fig. 9). A shape defined by said inner wall in a plane parallel to said main surface is one of circle, ellipse and polygon (fig. 9). The semiconductor light-emitting device be comprised in an electronic image pickup device (fig. 9). A reference plane of a rectangular shape is provided at a prescribed distance from said semiconductor light-emitting device, luminance at each comer of said reference plane irradiated with the light from said semiconductor light-emitting device is not less than 50% of luminance at the center of said reference plane (arbitrary plane especially if it is extremely small can anticipate). Abe, however, does not expressly disclose the inner wall being exposed from said first resin member at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface.

ii. Kunhiro discloses a light-emitting device wherein the epoxy resin (201, patent abstracts) does not completely fill the resin cup (202, patent abstracts).

iii. It would have been obvious to one of ordinary skill in the art at the time of the invention to have not filled the resin cup in Abe's device in order to reduce the amount of epoxy resin that must be pumped in thus saving material and time costs during fabrication.

b. Regarding claim 7:

i. Abe discloses a semiconductor light-emitting device comprising: a lead frame (32, fig. 9) having a main surface in which a first region and a second region extending along the periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a first resin member (35, fig. 9) having a first reflectivity with respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said semiconductor light-emitting element; and a second resin member (31, fig. 9) having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element (fig. 9), wherein said first resin member includes a first top surface, said second resin member includes a second top surface that is provided at a position where a distance from said main surface is greater than a distance from said main surface to said first top surface (fig. 9), and an inner wall that is provided on a side where said semiconductor light- emitting element is located and extends in a direction away from said

main surface to reach said second top surface, said lead frame includes terminal portions separated from each other by a slit-shaped groove (fig. 9), and said portions are formed thinner than the other portion of said lead frame (portion 32c overlayed by 32b is thicker, fig. 9). Abe, however, does not expressly disclose the inner wall being exposed from said first resin member at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface.

ii. Kunhiro discloses a light-emitting device wherein the epoxy resin (201, patent abstracts) does not completely fill the resin cup (202, patent abstracts).

iii. It would have been obvious to one of ordinary skill in the art at the time of the invention to have not filled the resin cup in Abe's device in order to reduce the amount of epoxy resin that must be pumped in thus saving material and time costs during fabrication.

b. Regarding claims 14-16:

i. Abe discloses a semiconductor light-emitting device comprising: a lead frame (32, fig. 9) having a main surface in which a first region and a second region extending along the periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a first resin member (35, fig. 9) having a first reflectivity with respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said

semiconductor light-emitting element; and a second resin (31, fig. 9) member having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element, wherein said first resin member includes a first top surface (fig. 9), said second resin member includes a second top surface that is provided at a position where a distance from said main surface is greater than a distance from said main surface to said first top surface (fig. 9), and an inner wall that is provided on a side where said semiconductor light- emitting element is located and extends in a direction away from said main surface to reach said second top surface (fig. 9), said lead frame includes a lead terminal (36, fig. 9) projecting from the periphery of said main surface and extending in a prescribed direction, and said lead terminal has a tip end portion having an end surface formed at a tip end extending in said prescribed direction (fig. 9), and a base portion located between the periphery of said main surface and said tip end portion (fig. 0), and said lead terminal is formed such that an area of said end surface is smaller than a cross sectional area of said base portion in a plane parallel to said end surface (fig. 9). The lead terminal has a first width at said base portion and a second width smaller than said first width at said tip end portion (fig. 9). The end surface corresponds to a cut surface formed by a prescribed cutting tool (fig. 9). Abe, however, does not

expressly disclose the inner wall being exposed from said first resin member at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface. Kunhiro discloses a light-emitting device wherein the epoxy resin (201, patent abstracts) does not completely fill the resin cup (202, patent abstracts).

ii. It would have been obvious to one of ordinary skill in the art at the time of the invention to have not filled the resin cup in Abe's device in order to reduce the amount of epoxy resin that must be pumped in thus saving material and time costs during fabrication.

Please Note: Claim 16 contains process limitations. These limitations invoke the Product-by-Process doctrine. Product-by-process limitations are not limited by the manipulations of the recited steps, only the structure implied by the steps (MPEP 2113). The burden to show that the claimed method necessarily distinguishes over the prior art is on the applicant.

2. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 in view Motokazu "044.

a. Abe discloses a semiconductor light-emitting device, comprising: A lead frame (32, fig. 9) comprising a main surface in which a first region and a second region extending along the periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a

first resin member (35, fig. 9) having a first reflectivity with respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said semiconductor light-emitting element; a second resin member (35, fig. 9) having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element (fig. 9); wherein said first resin member includes a first top surface, said second resin member includes a second top surface that is provided at a position where a distance from said main surface is greater than a distance from said main surface to said first top surface, and an inner wall that is provided on a side where said semiconductor light- emitting element is located and extends in a direction away from said main surface to reach said second top surface (fig. 9). Abe, however, does not expressly disclose the lead framed is part of set of three lead frames spaced apart and extending in different directions from each other with each light-emitting elements emitting light of a different color, each color selected from the group of red, blue, and green.

b. Motozaku discloses a light-emitting device wherein an set of RGB light emitting devices (1,2,3, patent abstracts) on frames (layer below chips and spacer 22 if present) extending in different directions from each other.

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used Motozaku's RGB configuration in Abe's device in

order to provide for a multicolor device and to reduce absorption of emission light between chips (patent abstracts of Motozaku).

PLEASE NOTE: With this medication Abe/Motozaku disclose that the lead frame is part of set of three lead frames spaced (cover, patent abstracts) apart and extending in different directions from each other with each light-emitting elements emitting light of a different color, each color selected from the group of red, blue, and green (patent abstracts) and the main surfaces of said lead frames provided with said semiconductor light-emitting elements for emitting the light of blue and green, respectively, are each greater than an area of said main surface of said lead frame provided with said semiconductor light- emitting element emitting the light of red (the red frame is smaller as it has no element 22).

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe/Kunhiro in view of Murano '247.

a. Abe discloses the device of claim 1 but does not expressly disclose the one end is formed in a line shape, and said another end is formed in a metal ball shape sandwich said metallic wire between the ball-shaped metal and said semiconductor light-emitting element.

b. Murano discloses a light emitting device wherein the one end is formed in a line shape, and said another end is formed in a metal ball shape sandwich said

metallic wire between the ball-shaped metal and said semiconductor light-emitting element (fig. 1).

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used Murano's wire connection technique in Abe's device in order to ensure good connections to the lead.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 /Kunhiro '759.

a. Abe discloses the device of claim 1 and that the lead frame uses a copper/nickel configuration (col. 5) but does not expressly disclose the lead frame has a proportion of copper/nickel to have a heat conductivity of not lower than 300 W/mK and not greater than 400 W/mK.

b. Nevertheless, It would have been obvious to one of ordinary skill in the art at the time the invention was made to a proportion of copper/nickel to have a heat conductivity of not lower than 300 W/mK and not greater than 400 W/mK in order to provide for a disparate set of devices to be used for a wide variety of needs, since it has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 / Motokazu "044.

a. Abe discloses the device of claim 20 but does not expressly that the inner wall is plate.

b. Nevertheless, it was conventional in the industry to plate inner walls of light-emitting cups with metal (e.g. nickel). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have plated Abe's inner wall of the light-emitting cups in order to increase reflectivity.

Response to Arguments

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amar Movva whose telephone number is 571-272-9009. The examiner can normally be reached on 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amar Movva
Examiner
Art Unit 2891

am

B. WILLIAM BAUMEISTER
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